

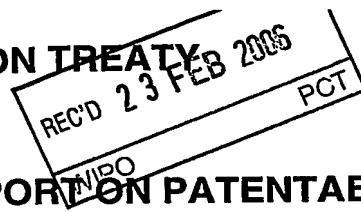
PATENT COOPERATION TREATY


PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference E-2471/04		FOR FURTHER ACTION	See Form PCT/PEA/416
International application No. PCT/EP2004/052981		International filing date (day/month/year) 16.11.2004	Priority date (day/month/year) 17.11.2003
International Patent Classification (IPC) or national classification and IPC A24C5/47			
Applicant G.D SOCIETA' PER AZIONI et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 7 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 16.09.2005		Date of completion of this report 21.02.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Marzano Monterosso, Telephone No. +49 89 2399-2902	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/052981

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

4-11 as originally filed
1-3 filed with telefax on 16.09.2005

Claims,* Numbers

1-10 filed with telefax on 16.09.2005

Drawings, Sheets

1/3-3/3 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/052981

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-10
	No: Claims	
Inventive step (IS)	Yes: Claims	1-10
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

The document WO 03/043449 A (D1) is regarded as being the closest prior art to the subject-matter of claim 1, since it relates to the problem of adapting a drum to different formats of the tobacco articles to be transported therewith without the need of a complete change of said drum. Document D1 shows a drum for transporting tobacco articles comprising a succession of seats parallel to the longitudinal axis of the drum, and means which act on each laterally offset rod like tobacco article, whereby said means are fitted to the shell of the drum to rotate with the shell and comprise for each seat a stop member to define a centred position of the relative tobacco article. Adjusting means are also provided to move the stop members equally and oppositely along the longitudinal axis of the drum.

The subject-matter of claim 1 differs from this known drum in that the stop members define a first and second succession of stop members, which successions are located on opposite sides of a reference plane and are intercalated so as if one seat is engaged by a stop member of a succession, the two adjacent seats are engaged by two stop members of the other succession.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as providing alternative means to adapt a drum for rod like articles to different formats of said articles.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: the drum disclosed in D1 is in fact a spreading drum and not a centring drum, so that the solution envisaged in claim 1 would not be applicable to the purpose of the disclosed drum; in other words the skilled person does not receive any hint from D1 to modify the structure of the drum disclosed therein in order to arrive to the subject matter of claim 1.

Claims 2-10 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

CENTRING DRUM FOR FILTER ASSEMBLY MACHINES

TECHNICAL FIELD

5 The present invention relates to a centring drum for filter assembly machines.

BACKGROUND ART

On filter assembly machines, filter portions, of a length equal to that of an even number of filters, normally four or six, are fed into a hopper, from which they are withdrawn by an extracting drum having a number of peripheral seats equally spaced about the extracting drum and for receiving and retaining respective filter portions by suction. Each of the filter portions is fed by the extracting drum through a cutting station where it is cut into a number of shorter filter portions defining respective double filters, i.e. twice the length of a cigarette filter, positioned coaxially inside the respective seat.

20 The double filters in each number are then transferred to an offsetting drum, which offsets them angularly with respect to one another to form, along its periphery, a number of rows of double filters equal to the number of double filters formed from each filter portion. The double filters in each row are equally spaced with a first spacing, which is equal for all the rows, about the axis of the offsetting drum, and each double filter in each row is offset, with respect to a corresponding double filter in an adjacent row, by a

second spacing equal to a submultiple of the first spacing.

The offset double filters are then fed to a centring drum, which shuffles the rows, by shifting them
5 laterally, into a single row in which the double filters are spaced with said second spacing. This single row is then fed in known manner to a feed line supplying cigarette portions, to form double cigarettes.

On known centring drums, the rows are normally
10 shuffled by means of fixed external converging plates, which gradually engage the rows of double filters, and slide the double filters axially along the relative seats into alignment with one another and into a central position normally centred with respect to a reference
15 plane crosswise to the rotation axis of the centring drum.

Though perfectly functional, known centring drums of the type described above have drawbacks when making any change in format, which normally involves changing
20 and/or dismantling and reassembling said plates, thus resulting in relatively prolonged downtime.

WO03043449A1 discloses a filter placement machine comprising a main drum and a number of additional assigned drums; the elements of the filter cigarettes,
25 namely the tobacco stock or partial stocks, filter pieces, cigarette units, and the filter cigarettes manufactured from these elements are conveyed through the main drum with the exception that partial stocks with an inserted filter piece that are displaced at a

distance from one another are conveyed out of the main drum in order to apply a covering paper and are joined to one another whereupon these now one-piece cigarette units are fed back to the main drum.

5 DISCLOSURE OF INVENTION

It is an object of the present invention to provide an improved centring drum designed to eliminate the aforementioned drawback.

According to the present invention, there is
10 provided a centring drum as recited in the attached Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

A non-limiting embodiment of the present invention will be described by way of example with reference to
15 the accompanying drawings, in which:

Figure 1 shows a schematic view in perspective of a preferred embodiment of the centring drum according to the present invention;

Figure 2 shows a substantially axial section of the
20 Figure 1 centring drum;

Figure 3 shows an exploded view in perspective of a detail in Figures 1 and 2.

BEST MODE FOR CARRYING OUT THE INVENTION

Number 1 in the accompanying drawings indicates as
25 a whole a substantially cylindrical centring drum mounted for rotation about a respective longitudinal axis 2, and which provides for receiving two side by side rows 3 and 4 of double filters 5 - which rows are located on opposite sides of a substantially central

CLAIMS

1) A centring drum for filter assembly machines,
the centring drum (1) comprising:

5 a substantially cylindrical shell (7) having a longitudinal axis (2) and a transverse reference plane (T), and rotating about said longitudinal axis (2);

a succession of seats (12) formed, parallel to said longitudinal axis (2), on the outside of said shell (7)
10 and equally spaced about said longitudinal axis (2); wherein each said seat (12) receives a respective filter portion (5), and at least some of said filter portions (5) are offset laterally, along the relative said seats (12), with respect to said reference plane (T); and

15 centring means (28) which act on each laterally offset filter portion (5) to centre it, along the relative seat (12), with respect to said reference plane (T); wherein the centring means (28) are fitted to said shell (7) to rotate with the shell (7) about said
20 longitudinal axis (2), and comprise, for each said seat (12), a stop member (40) located on a respective side of said reference plane (T) to define a centred position of the relative said filter portion (5), and push means (29) for moving the relative said filter portion (5)
25 axially onto the relative said stop member (40);

the centring drum is characterized in that the stop members (40) define a first and a second succession (41, 42) of stop members (40), which successions (41, 42) are located on opposite sides of said reference plane (T)

and are intercalated so as if one seat (12) is engaged by a stop member (40) of a succession (41; 42), the two adjacent seats (12) are engaged by two stop members (40) of the other succession (42; 41); and adjusting means
5 (31) are provided to move said two successions (41, 42) equally and oppositely along said longitudinal axis (2).

2) A drum as claimed in Claim 1, wherein said push means (29) are pneumatic means.

3) A drum as claimed in Claim 1 or 2, wherein said
10 push means (29) are suction means which come out inside the relative said seat (12), on the same side of said reference plane (T) as the relative said stop member (40).

4) A drum as claimed in any one of Claims 1 to 3,
15 wherein each said stop member (40) comprises a finger (40) housed in axially sliding manner inside the relative said seat (12), and having an end surface (43) facing said reference plane (T) and defining a stop surface for the relative said filter portion (5).

20 5) A drum as claimed in Claim 4, wherein said push means (29) are suction means which come out inside the relative said seat (12) at said end surface (43).

6) A drum as claimed in Claim 5, wherein said push means (29) comprise a suction hole (37) which comes out
25 inside the relative said seat (12), beneath the relative said finger (40); and a groove (44) formed along said finger (40), communicating with the relative said suction hole (37), and terminating at said end surface (43).

7) A drum as claimed in one of the foregoing Claims, wherein the stop members (40) in each said succession are integral with one another.

8) A drum as claimed in Claims 4 and 7, wherein
5 said first and said second succession (41, 42) respectively comprise a first and a second annular body (38, 39) which are coaxial with said longitudinal axis (2), are located axially outwards of said seats (12) and on opposite sides of said reference plane (T), and
10 connect the relative said fingers (40) to one another; said first and said second annular body (38, 39) being movable axially with respect to said shell (7), and being fitted to said adjusting means (31).

9) A drum as claimed in Claim 8, wherein said
15 adjusting means (31) comprise at least one first screw-nut screw coupling (52), in turn comprising a screw (50) extending parallel to said longitudinal axis (2), and a nut screw (51) formed through said first annular body (38); at least one second screw-nut screw coupling (58)
20 operating in the opposite direction to said first screw-nut screw coupling (52), and in turn comprising a screw (56) extending parallel to said longitudinal axis (2), and a nut screw (57) formed through said second annular body (39); and a ring gear (47) coaxial with said shell
25 (7) and mounted to rotate, with respect to said shell (7), about said longitudinal axis (2); each said screw (50; 56) being fitted integrally with a relative pinion (48; 49); each said pinion (48; 49) meshing with said ring gear (47); and actuating means (59) being provided

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to impart to said ring gear (47) a given, adjustable rotation about said longitudinal axis (2).

10) A drum as claimed in any one of Claims 1 to 9, wherein said filter portions (5) define a double filter (5) for cigarettes.